

# DRAGON USER

International edition

*The independent Dragon magazine*

95p US\$3.25

August 1985

## Semigraphics 24

Zoom in on  
the screen

WIN!  
Hewson's  
3D Lunattack

Disk Detective

Adventure Trail

WIN 15 copies of  
Jet Set Willy







# DRAGON USER



Telephone number  
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Production Editor  
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Editorial Secretary  
GERALDINE SMYTH

Advertisement Manager  
SIMON LANEJOSTON

Administration  
GERALDINE SMYTH

Managing Editor  
DAVID KELLY

Publishing Director  
JERRY IRELAND

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## How to submit articles

The quality of the material we can publish in  
Dragon User each month will, to a very great  
extent, depend on the quality of the  
articles that you can make with your  
Dragon. The Dragon computer was launched  
on 1st Feb 1982 with a powerful version of  
Basic, but with very poor documentation.

Articles which are submitted to Dragon  
User for publication should not be more than  
3000 words long. All submissions should be  
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addressed envelope.

# Contents



## Letters

Letters from and about Peter D'Arcy, Moon  
Miner query, system problems and many  
more — your forum for airing your views  
about the Dragon

## News

The third 4800 Show — to be held in  
November — new programs from Baby,  
Database and Microdeal, accounting pack-  
ages from two companies, a 2.8" Quick  
Disk for the 64, plus Plus and more

## Dragonsoft

New programs for your Dragon 32 and 64  
— two from Quickdraw, Homebase from  
Cable, Combat Air Patrol from Vidsco,  
Football Manager from Addictive Games,  
and MacDraw's a Primer Control

THE QUICK DRAW FOR THE 64  
BASIC

THE QUICK DRAW FOR THE 64  
BASIC

THE QUICK DRAW FOR THE 64  
BASIC

## Semi Graphics

A C Daniel shows you how to design  
screens in glorious technicolour, and how  
to put text in as well

## Disk Detective

Peter D'Arcy, reliable as ever, with an  
instant disk doctor program written in  
response to anguished pleas from Brian  
Cadge and others

# Editorial

AS DRAGON User goes to press, news is coming in about both Acorn and  
Sinclair.

A year ago, the Dragon was fading rapidly, and the BBC and Spectrum  
were both vigorous.

Then, nobody would have dared to predict that the two giants of the  
British home computer industry would face just the same sort of  
problems — but they are facing them.

Nor would anyone have dared to bet on the continued existence of the  
Dragon as anything more than a museum piece — but here we are,  
halfway through 1985, and the Dragon is still very much alive.

The Spectrum will survive, because of the vast number of games  
produced for it, and because over a million machines have been sold.

The BBC B will live on, because of the large number that have been  
brought for use in education.

The Dragon, too, is a survivor — the strengths of the 6502 will ensure  
that.

Certainly the recent news bodes ill for the British micro computer  
industry — but at least Dragon owners will no longer find that the collapse  
of Dragon Data is taken to mean that the Dragon micro is in some way at  
fault.

## Zoom

Another graphics program — Peter Whit-  
taker's Zoom allows you to blow up a small  
part of the screen so you can study detail  
more easily

## Open File

Reverse — David Griffin's game lets you  
play around with numbers

## Disk Utilities

Two useful disk utilities from the prolific  
Peter Whitaker — Disk Explorer and Disk  
Master Files

## Hewson Competition

Twenty copies of Hewson Consultants' 3D-  
Lunatic can be won in this special  
competition

## Adventure Trail

Mike Stevens, Master Soccerer, with more  
tips and hints for the perplexed adventur-  
ers — plus news of Dragon User's own  
adventure Help service

## Dragon Answers

Brian Cadge with another month's worth of  
Dragon problems — a cosmopolitan batch  
this time around

## Competition Corner

Gordon Lee in his usual quizzical self —  
Jet Set Willy is the prize

Cover courtesy Hewson Consultants



# Letters

This is the chance to air your views — send your tips, compliments and complaints to Letters Page, Dragon User, 12-13 Lifford Wayport Street, London WC2H 9PP.

## Pam's point

WHILE having a certain amount of sympathy with Anthony North (June Letters), I am grateful that half of the magazine is devoted to advertisements.

Without the advertisers, there would be no Dragon User at all, and then where would we be?

What I find more worrying is the non-readership. None of the Dragon users I know personally buy the magazine more than occasionally.

With more and more software outlets drying up, perhaps people will be forced into buying Dragon User — then with more sales will come more pages, and the proportion of adverts may not look so large.

Long live Dragon User and Dragon Suppliers.

Pam O'Kelly  
High Wycombe  
Bucks

## Vox Cumana

I HAVE a Dragon 32 with a Cumana twin disk drive and no software. Can anyone out there tell me if it is possible to convert Pro-File from Cable Software to run on my system, and how? Also is anyone selling a database that will run on my system?

A Deacon  
Rearworth  
Wales

## Peaksoft piqued

IN THE June edition, Brian Cadge answered an enquiry from a reader who was experiencing difficulty in running his Dragon 32 version of The Love's Choker on a Dragon 64.

The original issue of TLC would run only on the 32, and we therefore kept a small stock of unopened copies for mail order customers who informed us that they had a 64, and to exchange for customers who brought the incorrect version from other outlets.

However, every copy of TLC (and every other Peaksoft game) which has been supplied since mid-December, 1984, has been fully compatible with the Dragon 64.

Although your reader could, as Brian suggested, sell his Dragon 32 version to make a suitable for the Dragon 64, he is quite likely to have difficulty in persuading it to run unless he contacts us for guidance, and if he would care to return it to us, we would be pleased to exchange it for a later issue copy.

Mary Whitehouse  
Peaksoft  
at Queens Street  
Bathurst  
Newcastle NSW

## DOS thanks

FINALLY my two year subscriptions to Dragon User has paid off. Thank you for your article about Dragonoids in the May issue. We really do need information about this fascinating and underdocumented piece of software.

Please publish more about it!

A Rotzani  
Jagellonian University  
Institute of Physics  
Krakow 18  
Polymonta 4  
Poland

## Flex fan

I WRITE to protest on two fronts. Firstly the letter from Anthony North, June issue, complaining at the price of Dragon User. Pam (Delta's article with details of a Discount) is worth a year's subscription. Please Pam tell me how to do a print out!

My second protest is the unfair way in which Brian Cadge reviewed Flex. It is obvious to me that he did not study his subject enough. I first purchased Flex from Premier, and it was very good, but when Premier closed down I was given a great deal of help by Compuserve, and I now have a very good Flex system.

Brian seems to have missed most of the goodies on Flex; for instance the Utilities Disk provides many useful aids, like Filemap, which gives full memory details of any file, and

if required a complete dump of the file. There is also a very good Dis-assembler and Directory giving Date at which each file was made also start and end of file. There is also a lot more. I am not a very good programmer but I could fill several pages of Dragon User with details of Flex.

P McDonald  
9 Lowwood Close  
Little Common  
Dunhill-on-Sau  
East Sussex

FOR H McD and other Flex fans, we will have Flex Revisited by Ray Coates — see next month's issue.

## Miner problem

I AM writing to enquire about the Star Game (Miner) in June's Dragon User. After spending a few hours putting the program in I found that it would not run. I tried it again and all I got on the screen was MFC DATA ERROR. No matter what I did I could not get the program to work.

I was wondering if you could tell me if there was anything wrong with the program because if not it could be my computer as I have had trouble with it in the past.

Jayne Louthan  
Lamington  
Newcastle Upon Tyne

MFC DATA ERROR means that you have made a mistake typing in the data statements. The listing published was absolutely correct, according to Steve Gathercole.

If you have any further problems, Steve has very kindly offered to help any readers who need it — write to him at 18 Markinsdale Estate, Molesey St Andrew, Wokingham, Cambs. Remember to enclose a stamped self-addressed envelope!

## Good service

A SHORT while ago we recently had a problem with our DRAGONDOS where it refused to list the items — as a result the system was useless.

The ribbon cable looked as if it could be at fault and we

tried everyone we could think of but were unable to get a replacement — even Dragon themselves couldn't help. But — on phoning Compuserve they had tried!

However, after they checked the new cable with our equipment it was apparent that this was not the cause of the trouble. Although our Service Agents, Compuserve suggested we left our equipment with them and they would try and ascertain the cause of the trouble. They found it to be of mechanical origin, and promptly put it right.

The point I wish to illustrate is that not only are Compuserve good on software for the Dragon but they also offer courteous attention to Dragon users who have a problem. This cannot be said of many firms today.

J L Wood  
Enfield

## Delta

USERS OF THE DELTA DOS may be interested in a useful piece that switches off the DOS to allow long BASIC programs to run without CM errors.

Load the program from tape and insert at the beginning of the program the following:  
POKE 177,57: CLEAR 200:GOTO??

If the program contains a CLEAR statement then just type in the POKE. Now save to disc with SAVE "Namebase". This will disable all of the extra DOS commands so any attempt to use disk files will cause an OR error. If the DOS workspace was not overwritten when running the program then the DOS can be re-enabled with:  
POKE 177,128: CLEAR 200:GOTO??

In this way programs such as Dragon Trek, Wizard Wars, Pegasus's Diary and Up Perspective will all now load and run from disc.

How about an article on the DELTA DOS since it seems to me that there is rather too much coverage given to the somewhat inferior DRAGONDOS system.

D Neville  
175 West May  
Gravesend  
Kent DA12 5TX



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Please see our Information pages also containing 1 more programs

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Bankbook	Microsoft	£9.95	<del>£3.95</del>

## HOW TO ORDER

Write to us quoting the title, medium and price for the program you want. Please include 80 pence for postage (packing on single orders, add 15 pence for two or more titles ordered). Postage to rest of Europe is £1.50, and £3.00 to North America. If possible, please give your telephone number as well as your full address. Cheque/postal orders made payable to John Penn Discount Software. All the software listed is subject to availability. Please allow up to 28 days for delivery.

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**TRADE ENQUIRIES** We welcome trade enquiries and each order will be individually negotiated.



## Third 6809 Show

THE THIRD 6809 Show will be held on Saturday 23 and Sunday 24 November 1985, at the Royal Horticultural Society's (RHS) Hall in Westminster, London.

Tim Collins of Computer Marketplace, the organisers, believes that the show will be even more successful than the first two — "two thirds of the stands have already been taken, and we have had enquiries about the remainder."

Among the companies which have already taken space are Compuseries, Tandem, Camana, John Pire Oceanic Software, Software Projects and, of course, Sunshine Publications, publishers of *Dragon User*.

The doors will be open from 10 am to 6 pm both days, and admission on the door will be £1 for adults and £2 for children.

But Tim Collins pointed out that you can also buy advance tickets at a saving of £1 off the price on the door. Booking in advance will also save queuing — there was a two-hour wait on both days last year! Advance ticket holders will be able to avoid any hold-up on the door.

Computer Marketplace can be contacted at 20 Orange Street, London WC2H 7ED.

## Disk Doctor

**DISK Doctor** is the first product of a new company, Gemini Computing.

The disk contains a lengthy automatic series of utilities and functions which are designed to correct a large percentage of disk errors and problems encountered by Dragon owners.

The system can cope with multi-disk configurations.

Disk Doctor costs £14.95 inclusive of postage and packing.

Gemini Computing is at 112 Priory Avenue, Taunton, Somerset TA1 1YH.

## Harris boxing clever

THE LATEST release from Harris Micro Software is a set of integrated accounting programs designed for use with DragonDOS.

Three programs — Salesbox, Minibox and Cashbox — are due for release in August.

Salesbox is a Balance Brought Forward Sales Ledger with a number of features including aged debt periods, sales analysis and statements.

Minibox is a Balance Brought Forward Purchase Ledger.

Cashbox is a Double Entry Nominal Ledger program which allows the user to produce trial balances, balance sheets, profit and loss summaries and so on.

In addition, Cashbox can read Salesbox and Minibox files, and use the information in its own programs.

All three programs cost £19.99 each, and will soon be joined by programs dealing with inventory and stock control. Harris Micro Software is at 48 Alexandra Road, Hounslow, Middlesex.

## Autorun

**DATACOM** has just released **Autorun 11**, a utility package for the Dragon 32.

It enables users to design their own eight colour text or block graphic loading screens, and autostart their own programs.

It features a menu driven program, and needs no knowledge of machine code to use. It works for both Basic and machine code programs.

An additional feature allows the creation of a library of loading screens, which can then be used at a later date.

**Autorun 11** costs £3.99, from **Datacom**, 407F Hocking Centre, Birmingham B15 6AP.

## Plus plus

**MACTER**, Data Design has just written three further screen sets for its **Plus** interface. The new screen sets will be supplied free to Plus users, to demonstrate the company's continued support of the 32.

**Andex** is at 41 Fiddlers Road, Harrow HA1 3UD.

## Double entry

**SOFTWARE Design** has released three business accounts programs for the Dragon 32bit.

The programs can be used individually, or combined to provide a double entry book-keeping system which will provide results that you can take to the bank! Revenue.

**Software Design** is at 80 Woodway, Galsay, Huddersfield HD7 6PR.

## Robin

**MICROCAL** is doing very well with its new Pocket Money range, according to company spokesman Alan Hobbs.

"All the games in the series are programs sent in by British programmers — these were the ones we thought were good enough to develop further," Alan Hobbs said. "They are aimed at making up pocket money — £9.00 is a lot of money for a game."

The best selling title is apparently **Robin Hood**, in which the player has to rescue Maid Marian from the clutches of the evil sheriff.

Other games in the series include **Pit Pony**, a Rubik's cube maze game, **Bandito**, a light machine simulation, and **Peaceless Freddy**, a *Mini-Monster* type game.

**Microcal** is at 41 Truro Road, 181 Ayrton, Cornwall PL29 5JE.

## Quick disk

**RACORN** Electronics, which has been developing an MSX system for Eurohard, the Spanish manufacturers of the Dragon, has just released a floppy disk drive compatible with the Dragon 64.

Called the **Triton Quick Disk**, it is almost certain to be the same **Quick Disk** that Eurohard will be marketing in Europe under the Dragon trade name.

Fits load from the 2.8" double sided diskettes in a minimum of two seconds, and a maximum of eight, according to Racorn.

The **Triton Quick Disk** costs £119.95, including an interface box and all connecting cables and instructions.

## Blaby

**BLABY COMPUTER Games** has a number of new releases for the Dragon and Randy CoCo, including the company's first graphics adventure, **Second** and the **Sovereign**.

**Second** and the **Sovereign** is a menu driven adventure in which the player has to reassemble the three parts of a mystical key.

Various items dotted around the game can be useful to the player in defeating the barking monsters — without the incense, for example, the Medusa can be tamed.

Another **Blaby** game is **Caverns of Chaos**, a *Mini-Monster* type platform game with 20 screens. The key word **Piglet** will allow players access to any of the screens so that they can practice.

**Piglets** is a game about a safe bracket. It features 13 screens full of the usual hazards — disappearing floors, vampire bats, and so on.

One a Job follows the adventures of a young programmer trying to get to **Blaby Towers** to get a job. There are vicious obstructions, including chickens and police cars, which our hero can head off if the right object has been collected. All the games cost £3.99 from **Blaby Computer Games**, Crossways House, Lutterworth Road, Blaby, Leicestershire.







# Dragonsoft

New software for review should be sent to Dragonsoft, 12-13 Little Newport Street, London EC2M 1PP.

## Football

**Program:** Football Manager, Addictive Games, 7a Richmond Hill, Bournemouth, Dorset BH2 0HE. Price: £5.95.

**AD** A person with very little experience of football I was rather pleased as to how to approach this program.

The first time I played it I was not particularly impressed, but when my football supporter friend came round I loaded it up to show him, with the result that he was immediately impressed, and, subsequently, I have become highly addicted myself.

The game lets you manage any of a choice of 32 football teams, with all the inherent trials and tribulations of the task.

This is NOT a quick game that you can load up when you want a break from the revision — load this one up and you won't break till after the season!

Having picked your team you can choose to sell any of your players, obtain a bank loan, save the game (which I have had limited success with), re-load an earlier game, or go on to play a match.

If you decide to go into the match you are shown your team's average attributes, along with those of the opposition, at which point you can re-arrange your players, taking out those with low energy

and so on, and inserting others.

When you are happy with the changes that you have made the game starts and a running score is printed up as the game progresses (early there is no option to re-arrange the team at half time as there appears to be no half time in the game).

The league table and results of other league matches are shown, along with your finances for the week, and the game returns to phase one.

This process repeats for 14 league matches and however many FA Cup rounds you play. I have only won the FA Cup once but I can recommend doing so for purely financial reasons. I believe my share of the gate was one hundred thousand pounds.

Players are denoted as attackers, defenders, or mid-field players, and are allocated certain attributes: water skill (1-5) and energy (1-20). They are then valued at a level based upon their skill, and all the information can be called up in tabular form by the touch of a button.

To sum up then, the game is a definite for anyone with a love of football. If you are not of that ilk, but still like the sound of the game, then I would recommend it as it is programmed neatly and plays well.

Jason Osborne



## Combat Air Patrol

**Program:** Combat Air Patrol, Velpex, 125 Clarendon Road, Croy, Surrey CR9 7 1EG. Price: £3.95.

WITH SEVERAL flight simulators already available for the Dragon, it's interesting to check out a new one and see how it compares with the rest, though unfortunately C.A.P. doesn't compare too well. It's fairly comprehensive but is mostly in BASIC and so lacks a certain speed and excitement.

There are three phases you can choose from: Patrol, Landing and Refuelling. You begin in Patrol mode, though curiously your undercarriage is down despite the fact that

you're travelling at over 500 mph and at almost 3,000 feet. It's when patrolling that the combat sequences take place, with enemy aircraft appearing at random in your front sight or rear view mirror (or rear view mirror as the notes spell it). To deal with these you have 60 missiles and two missiles, though the sound and graphics are both rather lame unfortunately.

Pressing 'B' takes you into the refuelling sequence, where you're told the heading, height and speed you must attain before being allowed to try to line up your Tornado with a tanker in a separate little graphics sequence.

The Landing routine also

## Amoebae

**Program:** Home Base, Cable Software, Freeport, Luton, Beds LU2 2RH. Price: £5.95.

I CAN remember some time ago now, peering down a microscope in the biology laboratory at school and watching amoebae swimming around aimlessly, occasionally absorbing some tasty piece of material that happened to float their way. Home Base is a bit like that, only the amoebae are renamed laser balls, and you control a laser dome that moves amongst them, firing to the left and right.

A joystick is used to control movement, and it is important to avoid touching the laser balls, as your energy level drops when this happens. You have three domes to start with, and in the slow version of the game you can hide in the home base until there is a space to move in. The time you can remain in the home

base is limited, and in the fast version of the game, this option is not even provided.

The playing area is surrounded by a wavy line which represents the similarity to a cellular organism. This proves lethal if you inadvertently collide with it. After losing some rather good programs from Cable Software, I was a little disappointed with this game. I wasn't really very impressed with it and I think it would soon become very tedious. The display remains more or less the same throughout the game, and it's not too difficult to avoid the laser balls, even in the fast mode. Once you clear one screen, it fills up with more laser balls, and so on, and so on.

Perhaps I've come to expect too much from Dragon games nowadays, but unless you're heavily into microbiology, this is hardly one you'll come back to again and again.

John Seibert



## Printer Control

**Program:** Printer Control, MacGowan Consultants, 6 Arkland Drive, Caythorpe, Lincs NG20 3QG. Price: £15.

MACGOWAN Consultants is a new name to Dragon software and it's their first offering is anything to go by then it is a name that is going to become quite familiar. Printer Control can best be described as a powerful wordprocessor with even more powerful control of how the text is printed.

The hefty instruction manual gives some clue to the power of the software — the whole text was prepared using a standard version of the program. Printer Control, which is written entirely in machine code, automates re-feeding and automatically adjusts itself to work on either a Dragon 32 or a Dragon 64 in 32k or 64k mode. It is certainly nice to see at last some software arriving which takes advantage of the extra RAM when it is available. With 32k you get 10.6k free for your text files, and with 64k you get 25k. On a

gives you a heading and height to aim for before you can bring your Tornado (now a pool) down in the Landing Screen at bottom left of the main screen. This main screen gives you all the read-outs you need, including altitude, fuel supply, speed and heading, though the heading is simply the eight compass points rather than a specific bearing. There is no factor for pitch, you're always deemed to be flying level apart from when landing, and to play C.A.P. you need two joysticks — one acts as the throttle, the second as flight controls. Very complicated.

A lot of programming effort has obviously gone into the software, but the responses are just too slow to make it enjoyable — descending from 2,500 feet (at which height the combat sequences come into effect) down to a suitable height to commence landing takes forever. An interesting exercise for the programmer, but not for the potential buyer when better stuff is available from the likes of Hewson and Marsfield.

Mike Gerrard





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The program operates in two modes.

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PRINTER CONTROL is a cassette based system which gives 10.5 K space for text files on the DRAGON 32, 38K on the 64. Users with disc systems requiring customized services should enquire details of their DDD with their provider.

REAL VALUE FOR MONEY SOFTWARE



Snagor 64, in 64k mode only, the serial printer is supported with the baud rate set at 1200. The program will not allow you to use the serial port on a 64 in 32k mode. (Jing?)

The first thing that greets you is a menu of 11 options. These allow you to save, load and merge text files or enter one of the program's other modes. Selecting the EDIT mode changes the screen to a 42x24 column display. The lower two lines are used for prompts and commands. The program is very user friendly and always prompts for the next type of command required. In this mode the keyboard has autorepeat on most of the keys. Unfortunately the delay before a key starts to repeat is much too short for all but the best touch typists, and after a while it becomes frustrating to have to keep deleting the extra characters typed.

The character set supplied for the 42 column display is not particularly clear and falls short of that offered by other packages, such as Commodore's *WRITES* program, despite the fact that it is only 42 columns rather than 51 columns wide. There is no on

screen wordwrapping or formatting, this is all done in the printout only.

The usual sort of cursor controlled screen editor commands are available, such as insert, delete, find and change, as well as block move, copy and delete. A powerful feature is the option to take up to nine user defined strings. These could be a phrase or word that is to be used often throughout the text, or a command string to, for example, centre the line.

Another nice feature is the 'Address Book'. This is a number of lines reserved between the ESC-Alt and ESC-Alt characters (ESC-Alt is obtained by using shift+right arrow). These lines will be printed as a formatted address on the right of the paper. This is a useful option and eliminates a lot of mucking around with the cursor. All of the print format commands, such as centering of text, underline and tabbed, are entered as one or two letter commands following the ESC character. The effects of the command are not shown on the screen.

The big difference between this program and just any decent wordprocessor is its con-

trol over Epson type printers with graphic modes. Text can be printed in normal size or two, four or eight times normal size, in two character sets, with the option to define your own characters. The printer's bit image mode is used for this, so printouts can take quite a while. Graphics characters can also be printed.

The *Printer Control* program handles all the complicated business of sending the right graphic codes to the printer — all it needs to know are the appropriate control codes for the appropriate printer to enter bit-image mode, enlarged and condensed modes and so on. These can all be changed to suit your printer using the first option on the main menu. It is worth pointing out, however, that the program is only compatible with printers that use the Epson type, 8 bit wide, graphics mode — it will not work with the T bit vertical graphic mode type of printer.

Finally, not content with being a powerful wordprocessor, *Printer Control* has a 'Picture Mode' which allows you to edit PMODE 4 screens, loaded in from tape. The picture can be scrolled a single pixel at a time in all four

directions, text can be added to it, and blocks of it (8x8 pixels) can be rotated through 90 degrees. All of this is done on a copy of the loaded screen so the original is quite safe until all the changes are complete and the mode is exited by pressing Break. The screen can then be reserved to tape, or dumped to the printer in one of four sizes, horizontally or vertically.

*Printer Control* is a program anyone with a suitable printer should not be without, as at £15 it represents very good value for money indeed. A free advice and information service is provided for registered owners of the software, so support is guaranteed. A special version of the program will soon be released which is aimed primarily at correspondence work, giving double density text type, and one page right justification for letter print outs. This version will again be priced at £15. It would be nice to see a disk version of the program produced as this could offer much larger text files.

Drian Cudge



## Poor fuels

**Program:** *Dickie's Den*, Quickbeam Software, 87 Old Haining Road, Bournemouth, Hants. EN10 6PN. Price: £5.95

AT THE recent 6808 show I spoke to Quickbeam, and found them a pleasant company, who knew that their games were not original, and were proud of it I liked them!

This is their version of a certain Spectrum game which involved a man jelling around on alien planets, and collecting fuel for his spaceship.

There are five different alien types, several space-ships, and a difficulty level which controls how many aliens appear on a planet.

The scenario is this. There exist somewhere in this amazing and expanding universe, planets where pieces of fuel are free floating. You land on many of these planets, and must basically catch the fuel that precipitates from the top of the screen and load it on to your spaceship until, when your ship is full of fuel, you board and take off

To aid you in this task you have your handy jet-pack strapped to your back, and your super neutron blaster held in your hands to slaughter mercilessly any aliens that might happen to get in your way.

The game plays awfully and looks worse. The troubles with it are, in order of importance, 1) It's too fast 2) It's too jerky! 3) The graphics are nowhere near as good as the Spectrum version (and there is NO excuse for that!) 4) Every time you play in land on a planet you have to hear the over-worked strains of the Star Wars theme. (It occurs to me that if John Williams ever claims royalties from all the various companies that use his theme, he will make another fortune!)

I am sure that many software learners will rush out and buy this game, despite my warnings to wait for a better version to be available, but then, what can you do?

Jason Oriburn



## Dickie's dented

**Program:** *Dickie's Den*, Quickbeam Software, 87 Old Haining Road, Bournemouth, Hants. EN10 6PN. Price: £5.95

YES, IT'S good old Quickbeam back again for another friendly helping of fun. This time, the game involves walking a man around a mansion, collecting bits of masonry, and avoiding such items as booby watering cans, and other such hilarious items!

This game is very similar indeed to another game reviewed last issue (*Double Clue: Jet Set Willy*). So how does it compare?

The answer is... very badly. This game lacks all of the flair of its elder (and better). The game is once again jerky, too fast (although a variable speed option is available), and plainly amateur.

The graphics are not animated, they just jerk from one group of eight pixels to the next, and then back again. The man moves awkwardly, jumps lamely (although that could be due to faulty

physics) and generally is difficult to control.

The 'fun' in the background is a composer's nightmare, comprising of several discordant notes played in slow succession for ever — very dull!

When (or if) you finish *Jet Set Willy*, then this game could be worth a go as although it won't have been rather great, it could be a lot worse.

One question arises, what is it about the programmers of these games that leads them to name their characters in this way? We now have a *Minar* called Willy, and a construction worker called Dickie. My heart pounds at the thought of the name of the next game...

It is sad for Quickbeam that Software Projects has just released *Jet Set Willy*, as otherwise they would have had a winner, but as it is, they just have second place, and by more than a length.

Jason Oriburn





# Semigraphics 24

Ever wanted to design colourful screen displays — with text as well? A C Daniel shows you how

IF YOU want to make up an elaborate screen display using all nine colours with text but with high resolution then this program is for you.

The resolution of S.G.24 is 192 x 32 so your line artwork will consist of thin horizontal strokes, although for speed you can paint in thicker blocks including all the low resolution graphic blocks and the picture can be saved on tape at any time.

Once the computer is set to produce S.G.24 the screen cannot be altered so all the instructions have to be written out separately. So here they are — quite a lot I'm afraid, but I think you will find the flexibility and ease of use of the program well worthwhile. Apart from the initial input of the clearing colour all the commands are made by pressing a single key. A fairly long press is required, however, as there are a lot of alternatives for the computer to scan.

One problem of using S.G.24 is that it takes a lot of time to clear the screen in any colour except orange (0); so it is wise to use the clearing process to establish the main foreground and background colours.

## Clearing the screen

Clearing begins in the colour command by entering the standard colour number as soon as the program is run. To change the colour or stop the clearing press "C". This slows down the display and accesses other commands. You may now press "D" to stop the clearing (at the end of the current line) or press the number of the colour you wish to change to, to restart the current line in that colour.

To re-speed up the clearing (bypassing the above commands) press "F".

You may also clear all or part of the screen at any time by pressing CLEAR. In this case the clearing will start from the position of the cursor in the currently requested colour.

## Drawing

On completing the clearing you will see a flashing cursor in the top left-hand corner. This can be moved with the arrow keys in two ways:

- 1 Constructively, printing in the colour of your choice by pressing "B" and the number of the colour you require;
- 2 Non-destructively by pressing "I" before moving it.

You may also move the cursor diagonally by pressing "Z" (to bottom left), "X" (to top left), "N" (to top right), "M" (to bottom right).

## The second cursor

A second cursor can be introduced by pressing "Q". This can be moved with the arrow keys and then established in fixed position in relation to the first cursor by pressing "V". It can be moved construc-

tively or non-destructively (just like the first cursor and has a number of uses):

- 1 Used with the first cursor you can use it as a copying tool;
- 2 Press "I" and the space between the two cursors will be filled either by a horizontal line if the cursors are on the same level, by a vertical line if one cursor is on the top of the other.

In all other cases when the second cursor is lower than the first the space between them will be coloured.

To cancel the second cursor press "B". Note that if "I" is pressed when only one cursor is in use the remainder of the horizontal line is filled with the current colour.

## To write text

Press "I" and then type in the required characters. Only standard non-inverted text can be used and each character is printed so that it falls on to the nearest correct low resolution (PRINT) position.

To leave text writing press "I". To write one line below another it is necessary to move the cursor 12 spaces downwards.

## Setting specific cursor positions

Pressing "I" restores the cursor to the top left-hand corner.

Pressing "Q" memorises the current cursor position and this can be returned to by pressing "W" whenever necessary.

## The second set of commands

By pressing the spacebar you can scan a second set of commands and a block box appears at the bottom right corner to mark that you are doing this.

The number keys now refer not to colours but to the thickness of the line you draw — anything from one to seven lines thick. If you press nine, however, you get a standard low resolution graphics block correctly positioned as in text writing. The letters G, W, E, A, T, Y, U, I, O, P and A, S, D, F, G, H, J, K, L, give you all the different sorts of graphic block. The most important are Q which gives a BLACK block and A which gives a plain colour one. Try the others out using a special test routine which will automatically move the cursor from left to right drawing out full size graphics blocks which can be changed by pressing the appropriate key. Press "B" to start the test and "C" to cancel it.

To return to the original set of commands press "I".

When drawing diagonally a block can be drawn with the cursor either at the top or bottom of the previous block. The normal position is at the top so that each subsequent block starts one line above or below the previous one. To move the cursor to

the bottom return to the first set of commands and press "L". The only keys that can be used to move the cursor after pressing L are Z, M and N. The others produce anomalous results. To cancel "L" press "C".

## Tape saving

To save your design on tape press "T". A T appears at the bottom right corner. If you accidentally press T you may cancel it by pressing "I".

Otherwise press "R" to record or "S" to search for a design. The listing does not contain MOTOR ON or OFF as you must either set the tape recorder going manually or you can add in the commands (Lines 1650-1735).

When the tape process is finished the cursor begins to flash again. Having a pre-saved clear screen is in fact the quickest way of starting a new design.

## Printing

The printout has been designed for a four-colour printer plotter such as the COMP15. Press ENTER and a P appears at the bottom right corner. If ENTER is accidentally pressed it may be cancelled by pressing "I". Otherwise press P to proceed.

Text is handled first. The printout is extremely slow but it speeds up as much as possible if it proceeds to lower than the lowest point the cursor has reached and scan to colour above the highest colour number that has been used in the drawing. If you wish a printout use only the first four colours and black (yellow is left as white).

If you load a program from tape to print out directly you must move the cursor to the lowest point you need to print out and press the colour number of the highest colour used. The printout can only handle plain coloured graphic blocks, but it would be too complex to avoid this limitation.

## The listing

I have put REM lines in to guide you and there is also a tape saving routine. Type this in first and RUN/GO to operate it.

Having given so many instructions I only wish to make one point about the listing, it was done with a Teletek cartridge which makes copying similar lines very easy. If you do not possess this you may prefer to put groups of lines into loops, such as: FOR A=1 TO 10: IF PEEK(PAP)=QAI THEN C=1A: NEXT A having previously read your variables (PAI,DAI) and TOAI from DATA. Don't forget to DIM them either. Lines suitable for this treatment are 340-420, 1650-1690, 2050-2090 and 2120-2170. The longer and rather repetitive listing does make it easier to understand the function of each line, however.







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# Disk Detective

*Pat D'Arcy doctor disks to deal with desperate Dragon DOS enquiries*

HERE WE ARE, Brian Cudge, Simon Buxton (here Dragon Assistants) and other desperate Dragon DOS users — an instant "Disk Doctor" to enable you to inspect and change the contents of a disk. I have called it **DISK DETECTIVE** rather than **DISK DOCTOR** as it contains minimal facilities and was actually commissioned some time ago (when I would have paid pounds for a Disk Doctor to overcome problems I had with one particular disk at that time).

The intention had been to develop it to give a decent disk catalogue and "hard card" disk maintenance (as in KILL D'BUG — kill all files with bugs; BUG whose name commences with letter G) — also kind of time continues to interfere.

Having only got as far as the "view"

facility, I have quickly tapped on the "edit" facility for this article. I won't give you details of file directory layouts etc, as there is now an excellent booklet on Dragon DOS available from Converter Software (see their regularly placed adverts) and I am strongly in favour of supporting those who continue to support us!

As regards the program listing, REM lines were added later for documentation purposes for you — they can be omitted — as can the "PRINTER DUMP" lines if a printer is not available (though I haven't tried the program without these lines). Press the BREAK key to read the program (or include a, say, "G" check for Guts in the main MAKEYS facility routine — lines 320+ — if you want it all neatly tied up).

Good luck!

## Program synopsis

The program reads any physical block of 256 bytes that a disk is accessed in (= SECTOR#), stores it in memory and displays the data on the screen in "pages" of 64 bytes (page up/down using the up/down arrow keys). An EDIT facility is available which allows bytes of the sector currently in memory to be changed and for the updated sector to be written to the disk.

Options available in both EDIT and VIEW modes are:

- D Dump copy of state of sector currently in memory to the printer
- F Forward — read and display next sector on the disk
- B Backwards — read and display previous sector on the disk

```
100 REM DISK DETECTIVE - PAT D'ARCY - 12 JUNE 1985
200 PROCEDURE 1:PCLEAR1:CLEARSCREEN
300 DA=PEEK(14400)+256+PEEK(14408)
400 S=1:Y=200:S=5:SEV=0
500 SPACER4=CHR$(13)+CHR$(10)+SPACER8+SPACER8+SPACER8:REM PRINTER DUMP LINE
600 GOTO1000
700 PR="":GOTO1000
800 PR="ad1 "+PTRB+CHR$(95)+GOTO1000
900 GOSUB1000:GOSUB1000:PRINTPTRB:ENTER TRACK (0-25),SECTOR (1-120):INPUT T,S
1000 IF INT(T)<0 OR T=0 OR T>25 THEN990
1100 IF INT(S)<0 OR S=1 OR S>120 THEN990
1200 GOTO990
1300 GOSUB1000
1400 REM COPY STRINGS DA,DA+1 TO CONTIGUOUS DATA WORK AREA (RAMPHICS PAGE 10)
1500 Y=DA+V=V+PTRB:DA=PEEK(Y+2)+256+PEEK(Y+3):DA=DA+GOSUB1000
1600 V=V+PTRB:DA=PEEK(Y+2)+256+PEEK(Y+3):DA=DA+GOSUB1000
1700 S=S+1
1800 GOSUB1000:Y=DA+V:PRINTPTRB,S:PRINT"HEX(X) ":"
1900 GOTO1000
2000 IF PR="ad1 "+PTRB THEN C=0:R=0:PRINT1000,PTRB
2100 IF PTRB=CHR$(13)+PTRB THEN2100
2200 C=C+PTRB:PTRB="":PTRB=PTRB
2300 IF C="F" THEN2400
2400 IF C="B" THEN2500
2500 IF C="F" THEN2600
2600 IF C="D" THEN2700:REM PRINTER DUMP LINE
2700 PR="ad1 "+PTRB
2800 REM "VIEW" ONLY OPTIONS
2900 IF C="V" THEN3000
3000 IF C=CHR$(94) THEN3100
3100 IF C=CHR$(10) THEN3200
3200 S=S+1:IF S>25 THEN S=0
3300 GOTO1000
3400 S=S+1:IF S>120 THEN S=120
3500 GOTO1000
3600 REM "EDIT" ONLY OPTIONS
3700 IF C="E" THEN3800
3800 IF C="B" THEN3900
3900 IF C="C" THEN4000
4000 GOTO1000
4100 IF C=" " THEN4200
4200 IF C="X" THEN4300 ELSE3200
```



- F. View track and sector number — for getting around the disk fast

**Additional VIEW mode options:**  
 up/down arrow keys (page the 64 byte display back/forwards 1/2 screens)  
 E. switch to Edit mode

**Additional EDIT mode options:**  
 (display is the same as View except that there is a left arrow pointer against the "current" byte)  
 all the arrow keys move pointer as appropriate

- C. Change byte — switches to CHANGE MODE — see below  
 S. Save the current state of the sector in memory to disk. Because of the potential disaster that this facility could wreak upon your precious disk, two further prompts require Y answers before writing commences.  
 V. Switch to View mode (reads from the disk so can be used to re-read a sector if you have made a mess of the current inventory copy when attempting to save it)

#### CHANGE MODE operation:

(arrow pointer changes to inverted display)

- <enter> key      revert to EDIT mode  
 all the arrow keys      move pointer as required

0-9 A-F      change byte currently pointed to (changes the byte in the current memory copy of sector only at this stage; to copy (= write) the updated sector to disk, exit this mode (<enter> key) and use the S option and so on).

The byte is changed as per calculator type input (you will quickly see what I mean if you try it — it seems difficult to explain but I'll try).

On receiving a valid hex character, the current right hand hex character of the byte (= least significant nibble) overwrites the current left hand hex character of the byte (= most significant nibble) and the new hex character becomes the new least significant nibble which means that to replace a byte currently containing the ASCII character "B" (hex 055) with "A" (hex 041), I would

new 35 speed 41

press 4 " 35 becomes 54 (letter "T")  
 press 1 " 54 " 41 (letter "A")

The pointer is only moved on by using the arrow keys so you can have unlimited slots at getting the correct result if you are not too familiar with the hex codes (the ASCII display to the right of the 64 byte block is also updated with every key press).

Press the <ENTER> key to revert to the EDIT mode from where the SAVE SECTOR option can be called.

As recommended by Brian, backup the problem disk and mess about with the copy disk only! Having typed in the DISK DETECTION PROGRAM, SAVE it (with a filename), LOAD it, put the copy of the problem disk in the drive and RUN disk detective. It automatically commences in VIEW mode at Tract 25, Sector 3 (the start of the filename directory). Anyone having entered SAVE™ will find an entry similar to SECTOR DUMP 1 where I deliberately saved this program without a filename — an entry of DAS preceded by 0 null (000) bytes. The entry can now be edited to insert a filename.

Switch to Edit mode (press E)

Switch to Change mode (press C)

Move the pointer to the first character of the 3 character filename field (in this example, press right arrow key once).

Enter the filename (note later is sufficient to "recover" normal DOS services). I pressed 4 then 1 (= "A").

Press <ENTER> to revert to Edit mode.

Save the updated sector (press S-S-Y in response to prompts) and Bob's your uncle — normal DOS service is resumed!

Break out of the program and RENAME or whatever as you wish.

Have fun looking at your disks even if you are fortunately not in need of the EDIT facility ... yet.

```

430 IF S=00 AND T=0F THEN S=1:T=0:GOTO120
440 S=S+1: IF S=10 THEN S=1:T=T+1
450 GOTO120
460 IF S=1 AND T=0 THEN S=10:T=0F:GOTO120
470 S=S-1: IF S=0 THEN S=10:T=T-1
480 GOTO120
490 REM CHANGE BYTE
500 PTR=CH$(127)+PRINT$(27+(D*3)+(R*32)):PTR=GO$SUB$78
510 KB=INKEY$: IF KB="" THEN B=1
520 PTR=CH$(13)+THEMOSUB$(85):PTR=CH$(95):PRINT$(128+(D*3)+(R*32)):PTR=GO$D22
530 REM CHECK FOR 0-9,A-F FIRST
540 A=ASC(KB)-48
550 IF A<0 THEN A=0
560 IF A<16 THEN A=A
570 A=A*F
580 IF A=F AND A<16 THEN A=A
590 REM NOT HEX SO CHECK FOR ARROW KEYS
600 GOSUB1270
610 IF KB="" THEN B=1:GOTO430
620 REM CHANGE BYTE IN WORK AREA+DISPLAY
630 REM MOVE RIGHT HAND SIDE OF BYTE TO LEFT & PUT HEX VALUE ENTERED IN RIGHT HA
  LF (NIBBLE)
640 B=PEEK(KB+B*16+(D*10)+(R*32))-1
650 REM SAVE RIGHT HAND NIBBLE MAKE IT THE NEW LEFT HAND NIBBLE (<178 CURRENT W
  LLE+16)
660 B=B AND 15*16
670 REM STORE UPDATED BYTE VALUE IN WORK AREA
680 PEEK(KB+B*16+(D*11)+(R*32))-1:B=B
690 REM UPDATE SCREEN DISPLAY
700 PEEK(152+(D*3)+(R*32)):PEEK(153+(D*3)+(R*32))
710 PRINT$(128+(D*3)+(R*32)):KB
720 IF A=0*32 THEN KB="." ELSE KB=CH$(B+A)
730 PRINT$(128+(D*3)+(R*32)):KB
740 GOTO510
750 REM PRINTER DUMP ROUTINE (3 LINES)
760 GOSUB1200:PRINT$(440)," dumping to printer in progress"
770 DEV=2:GOSUB1200:DEV=3:FOR X=0 TO 255:STOP 44:GOSUB1140:NEXT X:PRINT$(DEV,SPACE
  8):X=X+1

```



```

700 DEV=0:GOTO1000:GOTO220
710 REM SAVE SECTOR ROUTINE
800 GOTO1020:PRINT#3,"write this sector to disk":PRINT#4,"ARE YOU SURE? (Y
IF NO)":
810 K=INKEY:IF K="" THEN#10
820 IF K>"~" THEN#100
830 PRINT#40,"CORRECT DISK IN THE DRIVE(Y)":
840 K=INKEY:IF K="" THEN#100
850 IF K>"~" THEN#100
860 GOTO1020:PRINT#40,"saving to disk in progress"
870 REM COPY UPDATED WORK AREA BACK INTO DRIVES SAVE,SEE FOR WRITE
880 FOR X=0 TO 127
890 POKE10A+X:PEEK10A+X
900 NEXT X
910 FOR X=0 TO 127
920 POKE10B+X:PEEK10B+128+X
930 NEXT X
940 WRITE D,T,S,0A,0B
950 GOTO1020:GOTO300
960 GOTO170:GOTO170:GOTO1020:RETURN
970 CLS:PRINT#0,"disk defective":PRINT#0,H:RETURN
980 PRINT#-DEV,"SPACE:PRINT#-DEV,H:REM PRINTER SUPP LINE
990 PRINT#-DEV,"DRIVE":D," TRACK":T," SECTOR":S:RETURN
1000 PRINT#0,STR$(H+132)," ":RETURN
1010 PRINT#0,""FOR P=1 TO 8:PRINT:NEXT P:RETURN
1020 PRINT#40,"":PRINT$H$132," "":RETURN
1030 P=4:GOTO1000:P=41:GOTO1000
1040 IF H="^" THEN GOTO1020:PRINT#40,"up/down arrows; Forward; Back; Dump
to printer; New addr; Edit":
1050 IF H="edit" THEN GOTO1020:PRINT#40,"arrow keys:pointer; Change byte; Save
new sector; View; F,B,N,D":
1060 RETURN
1070 GOTO1020:PRINT#40,"in Change byte mode; ENTER KEY to exit mode;arrow key
pointer":
1080 RETURN
1090 REM COPY 128 BYTES FROM GREAT STRING TO WORK AREA
1100 X=0:FOR X=0 TO 127
1110 POKE10A+X:PEEK10A+X
1120 X=X+1:NEXT X:RETURN
1130 REM DISPLAY/PRINT BLOCK 0=0 CHARS IN HEXASCII
1140 FOR X=0 TO X+5 STEP 5
1150 Y=0:FOR P=1 TO 8
1160 V=PEEK(X):IF V<16 THEN PRINT#-DEV,"0":
1170 PRINT#-DEV,HEX$(V):" "
1180 V=Y:NEXT P
1190 Y=0:FOR P=1 TO 8
1200 V=PEEK(Y)
1210 IF V<32 THEN PRINT#-DEV," ":GOTO1020
1220 IF DEV=2 AND V<17 THEN V=V-128:GOTO1020
1230 PRINT#-DEV,CHR$(V)
1240 V=Y:NEXT P:IF DEV=2 THEN PRINT#-DEV,""
1250 NEXT X:RETURN
1260 REM EDIT MODE - CHECK FOR ARROW KEY PRESSED:MOVE POINTER OR SET K1 TO PAGE
FORWARD/BACK
1270 A=ASC(K)-7:K=""
1280 IF A=0 OR A=8 THEN#110
1290 IF A=4 THEN#130
1300 IF A=7 THEN A=4 ELSE#110
1310 A=4
1320 PRINT$30+10*(3+8*(3)), " "
1330 ON A GOTO1340,1360,1390,1380
1340 IF C=0 THEN C=7 ELSE C=C-1
1350 GOTO1400
1360 IF C=7 THEN C=0 ELSE C=C+1
1370 GOTO1400
1380 IF R=0 THEN K="":GOTO1400 ELSE R=R-1:GOTO1400
1390 IF R=7 THEN K="":GOTO1400 ELSE R=R+1
1400 PRINT$30+10*(3+8*(3)),PTR$
1410 RETURN
1420 PRINT#0,BL:STOP

```



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# Zooming in on the screen

*Peter Whittaker developed this program to help him study the art of graphic character design.*

IT SEEMS that whenever I try to draw graphic characters for a game on my Dragon, the result falls short of the results achieved by some games-artists. Although I have not been able to improve my own artistic ability, I have written this program. ZOCAM is enable me to study the characters designed by other programmers.

The BASIC program controls a machine-code routine which will enlarge a quarter section of the screen to full screen size (see screen dumps). The process can be repeated endlessly, but after several enlargements the original pixels will have enlarged to a size greater than that taken up by the whole graphics screen.

**Programas de prevenção**

When HLM, the program will display its billable payers. This lists all the options available, and can be modified at any time.




by pressing the **<M>** key. When displaying the menu screen, the program will wait for a key press before continuing on to display the graphics screen. The program as listed is set up to load and save graphics screens to and from disk (Press **<N>** to load, and **<D>** to save), but this can be easily altered to load from tape.

```
(TAPE PATCH), or to draw a picture
instead (for example, change Line 200
POKE:FOR A=1 TO 10:CIRCLE
(RND (255), RND (181)), RND
(180+1 DEFENDS) AT A.
```

The program will then place a "Quarter-Screen" box over the picture. This is the target for JGCM. The box can be moved around the screen by pressing any of the arrow keys. The vertical arrows will move the box as good up or down. If these are pressed with the shift key, then the box will move up or down ten pixels. Pressing the left or right arrows will move the box eight pixels to the side. The program will not let the box move over the edge of the screen, but will keep it within the screen boundary. When the box is targeted over the area to be examined, press the <ENTER> key, and the screen will zoom in on that area. Once the screen has been enlarged, it can

```

2000" ON THE 32.
10 PROC=1:POLY SCREEN:0:SC=1
20 PB="BM113, 21,SL348U4,C2:55H:5:7,
  R55H44H:02R2R2F2D3G2L2B5H40:02R2R
  2F2D3G2L2B5H40:2R2F2H02G2R2F2D5
  "
30 FOR A=1 TO 30:DATA"SC"+STR$(A)+PB
  :NEXT
40 POLYFB:CLERR200,25000:CU=3216
45 MODE=0
50 "*****SCREEN BACKUP*****
60 DATA 142,12,0,16,142,109,200,236
  ,129,237,161,140,36,0,37,247,57
  ,142,12,0,16,142,109,200,236,16
  ,1,237,129,140,36,0,37,247,57
70 FOR A=1 TO 34:READ B:POKE25000+A
  :B:NEXT
75 "*****MENU SCREEN*****
80 CLS:PRINTB10,CHR$(133):"ZOOM MEN
  U" :CHR$(130):PRINTB42,STR$(H0:1
  ,131):PRINT"PRINT" :RETURN T
  O OPTION$ LIST H...LOAD HE
  M SCREEN FROM DISC. D...DUMP S
  CREEN TO DISC S...SAVE
  SCREEN TO HI-MEMORY. R...REST
  ORE HI-MEMORY SCREEN.
90 PRINT"1/2...SELECT COLOUR SET."
  PRINT"3/4...COLOUR OR MONOCHRO
  M."
100 PRINT"<ARROWS>...MOVE TARGET SO
  K. (ENTER)...ZOOM IN ON TA
  RGET."
110 PRINTB43,"KEY" KEY" (B327

```

```

PRINT@:CHARC(129);CHARC(131);CHARC
(133);) ;PRINT@B+34;CHARC(135);) ;PR
INT@B+34;CHARC(137);CHARC(140);CH
ARC(136);) ;PRINT@B+32;CHARC(133);) ;
ENDC01154
125 SCREEN1,80;IF MODE=0 THEN 400
130 *****BACK UP SCREEN*****
40 FOR A=1 TO 4-COPY A TO A+4-NEX
T
150 GOT0330
160 *****KEYS SCREEN*****
170 AB=KEYB;IF AB="" THEN 170
180 IF AB="3" THEN 400
190 IF AB="4" THEN 530
200 IF AB="1" THEN SCREEN1,8-80=8-G
OT0170
210 IF AB="2" THEN SCREEN1,1-80=1-G
OT0170
220 IF AB="H" THEN 50
230 IF AB="H" THEN CLS;PRINT@B43;"LOU
D SCREEN";PRINT@350;"";INPUT"
FILENAME";AB;LOAD@B4+"B.H";GOT01
20
235 *****CURSOR ROUTINE*****
240 IF AB=CHARC(9) THEN IF X<0 THEN
CU=CU-1;GOT0320
250 IF AB=CHARC(5) THEN IF X<128 THE
N CU=CU+1;GOT0330
260 IF AB=CHARC(94) THEN IF Y<0 THEN
CU=CU-32;GOT0330
270 IF AB=CHARC(18) THEN IF Y<32 THE
N CU=CU+32;GOT0330
280 IF AB=CHARC(5) THEN IF Y<0 THEN

```





Figure 3: Dragon game.

be enlarged again and again simply by enlarging the box, and pressing the <ENTER>.

If you are loading your pictures from tape, then it would be a slow process to load the screen each time you wanted to examine it. To overcome this I have included a screen backup routine. Pressing <C> will save the current screen to



Fig 1: ZOOM for black/white screens

high memory, and pressing the <R> will restore it to the screen.

The number keys from <1> to <6> control the screen colour set, and the colour mode. Pressing <1> selects SCREEN1.0 whilst the <2> selects SCREEN1.1. Pressing <3> selects PMODE3.1 and <4> will select PMODE4.1. There will be a short delay when changing from PMODE3 to 4 and vice versa, whilst the computer changes the machine-code used by the zoom (program line below). Pressing any other key will change the colour of the targeting box, to ensure that it can be seen whatever the colour of the background.

### Program explanation

There is a difference in the screen layout of the Dragon's two and four colour screens. The pixels in four colour mode require two bits each, whilst in two colour mode they only need one bit (see FIGS 1 and 2). This means that a different machine-code routine is needed for zooming in on colour screens (ASSEMBLER ZOOM PMODE3.1). However, in both cases we need to expand the contents of one BYTE to fit four. As it is the easiest to explain, I will deal with the two colour mode zoom first. (ASSEMBLER ZOOM PMODE4.1).

A BYTE is loaded into the 'A' register, and then manipulated into the 'H' register (FIG 3). Fig 4 shows the effects of the different machine-code instructions used. Step 1, load the 'A' register with the 8 bits.



Step 2, LSRH. This moves every bit in the 'A' register one place to the right. The rightmost bit is moved into the 'Carry' bit of the 'Condition Code' register.

Step 3, RORH. This moves all the bits in the 'H' register one place right, and then moves the Carry bit out of the Condition Code register, and into the leftmost bit of the 'H' register.



Fig 2: Zoom for colour screens

```

CU=CU-320:GOTO 330
290 IF A=CHRC(31) THEN IF YC96 THE
N CU=CU-320:GOTO330
295 *****ZOOM ROUTINE*****
300 IF A=CHRC(13) THEN 300
310 A=INT(CU/350):B=CU-(350*A)
320 POKE32002,A:POKE32003,B:EXEC320
01:GOTO140
325 FOR A=1 TO 4:PCOPY A+4 TO A:HEX
T
340 A=CU-3216:X=X0:Y=Y0
350 IF X+31<A THEN A=A-32:Y=Y+1:GOT
0350 ELSE A=A0
360 LINE(X,Y)-(X+127,Y+35):PSET,B
370 GOTO170
375 *****H-MEMORY SCREEN*****
380 IF A="S" THEN SOUND100:FOR A
=1 TO 4:PCOPY A+4 TO A:NEXTA:EX
EC 20001:GOTO 140
390 IF A="R" THEN SOUND100:EXEC2
0010:GOTO 140
400 IF A="D" THEN FOR A=1 TO 4:PCO
PY A+4 TO A:NEXTA:CLS:PRINT666:"
SAVE SCREEN":PRINT6355:"":INPU
T"FILENAME":A$=IN$A$+3072,3216
,0:GOTO120
410 *****BOX COLOUR*****
420 Z=Z+1:IF Z=5 THEN Z=1
430 COLOR Z:LINE(X,Y)-(X+127,Y+35):
PSET,B:SOUND100:1
440 GOTO 170
450 *****COLOR ZOOM*****

```

```

460 DATA 0E,24,0,10,0E,C,0,0E,10,07
,70,40,0E,00,07,70,47,00,1E,07,
00,21,07,21,00,17,07,00,20,07,A
1,70,70,40,20,00,31,00,20,30,00
,10,10,00,24,0,20,07,30,00,3,00
,1,30,47,00,47,00,00,70,47,47,0
0,47,00,07,70,47,30
470 RESTORE:FOR A=1 TO 34:G0A0 B=N
EXT
480 FOR A=32001 TO 32009:READ B:PO
KEA,VAL("H"+B*00):NEXT A
490 PMODE3.1:MODE=3
500 FOR A=1 TO 4:PCOPY A+4 TO A:HEX
T A
510 GOTO120
520 *****H-M ZOOM*****
530 DATA 0E,24,0,10,0E,C,0,0E,10,07
,70,30,00,00,00,1E,07,00,21,07,
21,00,17,07,00,20,07,A1,70,70,3
0,20,00,31,00,20,30,00,10,10,00
,24,0,20,07,30,00,4,77,70,30,44
,00,07,70,70,3E,20,00,30
540 RESTORE:FOR A=1 TO 100:READ B:
NEXT
550 FOR A=0A0001 TO 0A000C:READ B:
POKEA,VAL("H"+B*00):NEXT A
560 PMODE4.1:MODE=4
570 FOR A=1 TO 4:PCOPY A+4 TO A:HEX
T A
580 GOTO120
590 *CGL1985 BY PETER WHITTAKER

```





**Step 4: ARPS** This duplicates the leftmost BIT in the **IR** register, by moving all the BITS one place to the right. However, unlike the previous step, the leftmost bit is left unchanged.

Step 5. The "V" register is transferred to the screen, left to right, and then the process is repeated from Step 2, to enlarge the other half of the original BYTE. This process is continued until the screen is filled, and the picture is fully enlarged.

**Step 9.** Load the 'A' register with the B77E, and store it at 0A7E40.

**Figure 1**

**Step 4. LIA of TEMF** restores the  $\chi$  parameter to an  $\chi$  value between 0 and 1.

Figure 1. The effect of the number of trials on the number of correct responses. The number of correct responses increased with the number of trials, and the increase was more pronounced for the high condition than for the low condition.

the same two bits across from 'A' to 'B' as in steps 2&3. (for example: 10 in 'A' is now 11 in 'B')

**Step 7. Repeat steps 2-6 to fill the 10**

Step 5. Repeat steps 2-4 to double the number of cells and after 142 generations, cells are 100

Step 4. Repeat steps 1–3 until the series is full.

The program uses the first four graphics pages for its display, and the next four is store a duplicate screen. When zooming the machine code copies the picture from pages 5-8 onto pages 1-4. The enlarged code is immediately moved to pages 5-8.

[illegible]

The saved screen (-cSx/-cMx) is stored  
high-resolution starting at 000000

200M is listed for the Dragon with disk drives attached. Because the disk drive releases the graphics screen, 100M BITEs higher in memory, there are several alterations which need to be made if the program is to be run without disks. Under the 200M listing, and save it in tape. Then make the alterations last of in the 200M TAPE PATCH listing. Now save this as the working version of 200M for use without disks.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

70-01	8853488	880	8853
70-02	8853488	880	8853
70-03	8853488	880	8853
70-04	8853488	880	8853
70-05	8853488	880	8853
70-06	8853488	880	8853
70-07	8853488	880	8853
70-08	8853488	880	8853
70-09	8853488	880	8853
70-10	8853488	880	8853
70-11	8853488	880	8853
70-12	8853488	880	8853
70-13	8853488	880	8853
70-14	8853488	880	8853
70-15	8853488	880	8853
70-16	8853488	880	8853
70-17	8853488	880	8853
70-18	8853488	880	8853
70-19	8853488	880	8853
70-20	8853488	880	8853
70-21	8853488	880	8853
70-22	8853488	880	8853
70-23	8853488	880	8853
70-24	8853488	880	8853
70-25	8853488	880	8853
70-26	8853488	880	8853
70-27	8853488	880	8853
70-28	8853488	880	8853
70-29	8853488	880	8853
70-30	8853488	880	8853
70-31	8853488	880	8853
70-32	8853488	880	8853
70-33	8853488	880	8853
70-34	8853488	880	8853
70-35	8853488	880	8853
70-36	8853488	880	8853
70-37	8853488	880	8853
70-38	8853488	880	8853
70-39	8853488	880	8853
70-40	8853488	880	8853
70-41	8853488	880	8853
70-42	8853488	880	8853
70-43	8853488	880	8853
70-44	8853488	880	8853
70-45	8853488	880	8853
70-46	8853488	880	8853
70-47	8853488	880	8853
70-48	8853488	880	8853
70-49	8853488	880	8853
70-50	8853488	880	8853
70-51	8853488	880	8853
70-52	8853488	880	8853
70-53	8853488	880	8853
70-54	8853488	880	8853
70-55	8853488	880	8853
70-56	8853488	880	8853
70-57	8853488	880	8853
70-58	8853488	880	8853
70-59	8853488	880	8853
70-60	8853488	880	8853
70-61	8853488	880	8853
70-62	8853488	880	8853
70-63	8853488	880	8853
70-64	8853488	880	8853
70-65	8853488	880	8853
70-66	8853488	880	8853
70-67	8853488	880	8853
70-68	8853488	880	8853
70-69	8853488	880	8853
70-70	8853488	880	8853
70-71	8853488	880	8853
70-72	8853488	880	8853
70-73	8853488	880	8853
70-74	8853488	880	8853
70-75	8853488	880	8853
70-76	8853488	880	8853
70-77	8853488	880	8853
70-78	8853488	880	8853
70-79	8853488	880	8853
70-80	8853488	880	8853
70-81	8853488	880	8853
70-82	8853488	880	8853
70-83	8853488	880	8853
70-84	8853488	880	8853
70-85	8853488	880	8853
70-86	8853488	880	8853
70-87	8853488	880	8853
70-88	8853488	880	8853
70-89	8853488	880	8853
70-90	8853488	880	8853
70-91	8853488	880	8853
70-92	8853488	880	8853
70-93	8853488	880	8853

[illegible]











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SEVERAL letters from readers recently have bemoaned the lack of *Dragon* software in the shops, and adventures suffer particularly badly in that respect with most distributors giving the impression they wouldn't touch text-only adventures while wearing rubber gloves. Other readers have asked about bargain-price adventures, such as this. Maureen Adams of Sturley in the West Midlands, is considering the two subjects I'll have a look this month at three older but interesting titles available from Touchmaster for only £1.99 each (plus £1.50 P&P per order).

### Gulible guards

First *Countdown* gives you the comparatively simple task of preventing World War III, and you do this by stopping a mad general from launching a nuclear missile. You begin the game outside the missile base in a van, and a good hand round here will provide you with the means of getting past the rather gulible guards on the main gate.

The adventure isn't exactly heavy on authenticity, for example, look at the Bulletin Board which contains only a note saying "Watch your step on stairways," but it's not at all bad. You can wander round various supply rooms, computer rooms and offices, hopefully finding the secret stairs up to the command centre, and beyond that through the obligatory maze to the launch control centre.

Here, as elsewhere, you're faced with a panel of buttons but you have no idea as to what the outcome of pressing each button might be. You might be doing the mad general's work for him, going down in history as the person who started World War III, but if you don't do something you're in trouble anyway as the general himself turns up after a certain number of moves (seemingly dependent on which of the three still levels you choose) so this one is more a race against the clock.

There's no SAVE routine, but it's an unprotected BASIC program with over 12K of memory left so the more adventurous adventures might try to incorporate one of their own. By no means a heavyweight adventure, but it should keep beginners entertained and puzzled for quite a while, and even the adventure-starved experienced player might like to try it at this price.

The next title shows that we adventures obviously haven't been pulling our weight lately, because there are still scores of undead creatures around, the latest being Count Van Steinoff in his Mansion of Doom in Transylvania. I thought we'd have killed them all off by now, but seemingly not, and now the Count's gone and kidnapped Crown Princess Mariana. Female adventures must use their imagination, and pretend they're rescuing some dreamily handsome prince.

The Count's mansion is positively swarmed with galleis, silver bullets, wooden stakes, hammers and all the other trappings familiar to vampire hunters every-where, but there are also lots of adverbials and this was my favourite of the Touchmaster titles. There are plenty of locations available to you at once, on the various floors of the mansion, and you're not faced with insurmountable problems before you've even started.

There is an early problem, which is how to stop the candle blowing out when you reach the stairs leading to the lower levels, but you can forget about that and go upstairs instead where there are dooms and dozens of rooms. Hidden somewhere in one of these is a watch, which you can examine to see how it's ticking away towards sunset (the time of which you're given elsewhere).

### Rancid rooms

Also available for examination is a map, but quite what it's a map of I don't know as it's written in Transylvanian, as are many notices around the place, and I haven't got figured out how to use my Transylvanian dictionary from the library. With rancid rooms, rooms full of worms and rooms smelling of decaying flesh, this is definitely not one to play while you're eating your supper, but it's one you should try to look at as it's about the best *Dragon* OSculus adventure I've seen, using up almost all the available memory.

The first title this month is actually two for the price of one, *Stalagluft*. *Stalag*, as you might imagine, is a case of escaping from a prisoner of war camp, though it's not the enemy you've got to watch out for because the camp has been deserted and is about to be bombed by your own side in order to obliterate it. It was your bad luck to get poached out in the Hot Box, used to

welcome new prisoners, and then forgotten about as the camp was abandoned. As you explore the various barracks and open area in the camp, you are comically reminded of your time running out by the sound of planes flying overhead from time to time.

### Baseball bat

In the shower but there's a drain grating, but it's rather sludgy and won't move, while atopsteep it is a piece of leaking plumbing which I've been trying to do up to fill a nearby bucket, though what I'll do with it if I manage it I'm not sure. In an attic I've found the power switch for the fence ... but would the departing guests have left it switched on or off? And what use is the baseball bat and the football? *Stalag* doesn't support a very extensive vocabulary (in fact none of these games do) and you'll have to make regular use of the web EXAMINE, with concerned objects sometimes concealing other objects.

Turn the tape over and you've got *Enc*, the first puzzle here being what does the title mean? I've no idea, but the adventure is as unusual as the title, being the first one I can remember which takes place in a single location! The story is that your rich aunt has died and left her fortune to you, provided you can find it. It has been hidden somewhere in the living room, which is where the whole adventure seems to take place. There are three different areas of the living room that I've found so far, unless there are secret passages ... goodness, the place doesn't even seem to have a door!

It does have lots of rags, chains, lamps and other everyday objects, and while it recognises the verb MOVE I've tried moving everything but nothing ever seems to happen. There are lots of items concealed, a TV set that's showing Allen, and a picture of your aunt's cat which I thought might protect me from a lurking rat ... but it didn't.

There's also lots of dry humour lurking in the terse responses to some of the inputs. Examine the stuffed chair and you're told "It clashes with the curtains," while LOOK WINDOW produces "There goes the mailman." Those maybe don't sound very funny on the page, but their lively game me a few laughs when I'm tired hoping to uncover some helpful clue. If you want an



adventure that's intriguing, then try *Eto*, though I was pleasantly surprised by all these Touchmaster titles.

Another bargain on offer, which I've mentioned before, is *El Diablo* from Intervale at 99p plus 99p postage. I don't usually bother giving the addresses of companies like Intervale, whose adverts are always in the magazine, but as some readers will write in and ask about them I shall tell you that they're at 41 Trent Road, St Austell, Cornwall. If you are already an *El Diablo* fan then you'd be interested in the newly formed Adventurers Club Ltd, details of which are on the news pages this month. Their first lengthy newsletter included a detailed look at the devilish *El Diablo*, going through the game but going veiled hints rather than answers to problems.

Too many readers' this month to mention them all, but several people did write and ask for the help sheet on *Madness and the Minotaur*, which I offered in exchange for s.a.s. a couple of months ago. These have gone out, though they are only hints rather than solutions, but I hope they have come in useful.

Lots of help offered on *The Crockwood Incident* by Paul Watson of Herecastle, who has actually managed to complete that wretched game, the one which has driven many of us batty. I'll be printing some of Paul's clues next month, space permitting, and perhaps making a typed list available for anyone who's interested — send s.a.s. if you are.

Tips on *Ring of Darkness* from Neil Bowden of Falken, for those having difficulty crossing water or mountains. Just keep plugging away at increasing those experience points and you'll find that the shops in the towns closer to the obstacles will start to offer you more interesting items, like rats and mules. If you're extremely frustrated or just plain daftoned, Neil says **BREK** into the program and type **CHG** + **CHG** + **X**, where **X** is the number of additional points you want, with a 4, 1, 2, 3, 5, 8 or 9 to represent respectively your present level, IQ, strength, agility, hit points, experience or gold. Then type **GO TO 4858** to resume play.

Even with extra space there's no room to deal with all this month's letters in the course, though everyone will get a reply. If you do write, just bear in mind that

Sunshine Publications gets a mountain of mail every day and therefore it does take time to sort all the letters and get them to the people concerned. If you have to wait a while, that's the reason.

I have to find room for one final letter, though, from Matthew Lodge, giving help to those frustrated by the lack of a SAVE feature in *Madness and the Minotaur*. Matthew says you should type **QUIT** (**ENTER**) then press **BREAK** once. Start the cassette recording, then press the 1 key. Its LCD what you have saved, type **QUIT** (**ENTER**), then **BREAK** key once, then the 1 key (**000-1**) and the mouse will start and the game will load. He's also discovered that typing **SACK** is useful in the maze and beyond blocked doors. So a final thanks to Matthew for taking some of the madness out of *Madness and the Minotaur*.

## Adventure Helpline

To help puzzled adventurers further, we are instituting an Adventure Helpline — simply fill in the coupon below, stating the name of the adventure, your problem and your name and address, and send it to Dragon User Adventure Help-

line, 12/13 Little Newport Street, London WC2N 7PP. As soon as enough entries have arrived, we will start printing them in the magazine.

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## Cayman query

IN 1985 part of the world there is a tremendous amount of software for the TMS-80 Color Computer. I would like to take advantage of this.

Recently I bought my first CoCo 8000 Cartridge, but when inserted into my Dragon 64 there wasn't any response.

Could you please outline to me why this doesn't work, or if there is a general problem in using CoCo 8000 Cartridges with the Dragon. If so what can be done to remedy the problem?

Finally, is the disk format of the Color Computer the same as Dragonides, and will the former's disk software work on Dragonides drives?

P Ouyang  
PO Box 8857  
George Town  
Cayman Islands  
SMB

WITH Dragon software becoming increasingly difficult to find in the high street everywhere it is worth printing the list of Tandy cartridges which will work with the Dragon computer. These are: *Shogun, Colour Ackermann, Tennis, Skip the Wreck, Galactic Attack, Andrews, Space Assault, Dino Wars, Project Helix, Chess, Super Destroyer, Roman Checkers, Whistling, and Bingo Math.*

All of these will work with the Dragon with the exception of some the 'save game' facilities in some of them (such as *Chess*). See Heads to Peter Prendel for preparing this list for us.

Dragonides disks are not compatible with CoCo disks.

## Circuits

WROTE, CAN I get a copy of the circuit diagrams for the Dragon 64?

J C Kinsley  
London House  
London  
Surrey  
South SA10 4SD

FOR ALL those readers that keep trying their own repairs or modifications, circuit diagrams, previously only available from Dragon Data, can now be obtained from Compuserve. As the circuitry for the 64 is different from the 32 you should state which model you have when



ordering. They cost £2.99 each. Compuserve can be contacted on 01-882 6681.

## Error—or not?

WHILE tinkering about with my Dragon 32, I happened to type in POIN1 POS (-1). This gave me an error in the form 'NO ERROR'. I have never heard of this one, so I checked my manual and sure enough it wasn't there. Could it be an operating system bug? An omitted bug? What do you think it is?

Also, is it possible using machine code to get all nine colours in PMODE 4 on the Dragon?

Jonathan Thomas  
Wid Glam

THE POS function returns the current horizontal pixel position of the given channel. POS (0) gives the column of the test cursor, POS (-2) gives the column of the lineprinter, and POS (-1) should give the 'column' of the cassette buffer position.

The NO ERROR you get stands for Not Open and is in fact mentioned in the manual. This occurs because you have not used an OPEN command. If you try OPEN "0", "1", "2" and then type POS (-1) you will get a zero returned and no error. In fact the POS function always returns a zero with the cassette channel and so is of little use to the Basic programmer.

In PMODE 4 the hardware will only allow the use of two colours, black and green, or black and white.

## Hash bug

I AM the manager of a test transfer equipment design and manufacturing company and have

adopted a Dragon 1st computer with OS9 system for manual and code calculations of our products.

We are actually trying to use the system to make our cost estimations and to this end we accumulated our equipment data in database files with the OS9 R.M.S. (record management system).

Unfortunately the hash coding algorithm listed on page 43 of the Dragon Data R.M.S. manual does not seem to work and we are not able to retrieve the records from the files.

I will be very much obliged if you could get me the correct algorithm for hash coding of the key fields to permit us to explore the remarkable features of the OS9 system to their full extent.

F Cassaro  
Israel

THE 666 in the R.M.S. hash coding program is on the eighth line up from the bottom, which should read as follows:

66-6+6-328/255\*255\*255  
is M and N

Making this adjustment should mean that the program will run without any further error.

## M/c auto

COULD YOU tell me how to get my machine code programs to run automatically on loading. I know it must be difficult as both

Four Computer and Dragon should have shed away from the subject.

Paul Cleary  
Middlesbrough

ONE OF the simplest ways to automate machine code programs is to use the program below. Your machine code program should be located low down in memory (perhaps stored in the graphics pages) starting at 10240, if not, if necessary, relocate itself into high memory once loaded.

The first instructions in your code must be:

```
LDH #RT
STX 300
LDH# 2.5
```

This reads the pixel vector which is used to subvert the program. The screen displayed when saving will also be displayed when re-loading the program (using LOAD).

```
10 INPUT "FILENAME=";F$
20 INPUT "END ADDR=";E$
30 INPUT "SRC ADDR=";S$
40 CLS:PRINT#1:255,"*SACRED PROGRAM*"
50 MCH=INT (E$*256/L$)-E$-MCH-256
60 POS=300,176:POS=300,
MCH:POS=301,L$
70 CAYMAN PS,300,CH,EX
80 POS=300,57:END
```

## M/c run

COULD YOU please tell me the machine code routine for 'Run' a basic program which has been stored on a disk (the equivalent of: RUN-PROG. BAS) ?

Gordon Ollie  
Epsom Surrey  
France

THE following assembly code will load and run a program, machine code or Basic, from disk. The filename given must include the quotes and there must be a zero byte after the closing quote.

```
LDH #FILENAME
STX 100
JMP 10-100
FRAME FCC "A,FILENAME",
BAS,34,0
```

FINALLY, a note regarding my answer to Simon Barker in the June issue: I mentioned there was a need for a disk loader type of program for Dragonides.

Since then a number of readers, including Martin Walsh and J Parker have written to tell me about a program called Disk Transfer by Ian Kingdon. This program is available for £10 and includes some simple utilities, including sector editing, viewing and disk to cassette backup. Ian Kingdon can be contacted at 11 Whitelake Gardens, Balfour, Shipley, W. Yorks.







## August 1992, December 1992, 1993 33



# Get set to win Jet Set Willy!

Gordon Lee sets another mathematical conundrum —  
Software Projects' Jet Set Willy is the prize

THINK of a number — that is, any positive whole number. If the number is even, divide it by two. If it is odd, multiply by three and add one. This will give you a new value on which you repeat the same operation as before. This is then continued until a specific endpoint is reached.

But what is this endpoint? There are, it would seem, three probable outcomes to the exercise. Either the number will increase without limit, or possibly, it may decrease until it reaches the value of one. Alternatively, there is a third possibility — somewhere during its operation, it may happen upon a value that has already been reached. If this should happen, thereafter it would be bound up in an endless loop of repeating numbers.

You might expect that any one of these possibilities might occur, depending perhaps on the initial value chosen. This is not so. All numbers so far tested by this method will eventually terminate at only — although it must be stated that there is, at the present time, no rigid mathematical proof that this is the case for all numbers. This lack of a proof, together with the necessity to perform a rapid sequence of calculations, has resulted in this problem recurring from time to time in computer literature. All starting values from 1 to 242 — a thirteen digit number — have been tested by computer and all invariably reduced to one in a greater or lesser period of time.

Let's take a couple of easier examples and see how the problem works out. If we take as our starting value 26, we get the series: 26, 13, 40, 20, 10, 5, 16, 8, 4, 2, and 1. Similarly, with 28 we get 28, 14, 7, 22, 11, 34, 17, 52, 26, 13, 40, 20, 10, 5, 16, 8, 4, 2, and 1 — a slightly longer series this time, but again with the same eventual result. However, if we were to start with 27, the series would not finish until after 111 steps, during which time the largest number reached in the series would have been 9,232. This prompts a second question within the original problem. For a given number (N), is it possible to predict mathematically both the eventual path length (L), or the maximum value reached during the operation (M)? So far, the answers to



these questions remain something of an enigma, and it is mainly as a result of computers working out these values experimentally that an idea of their nature is known. Taking just the three examples already mentioned, figure 1 at the foot of the page below shows something of their capricious nature.

Readers who wish to pursue their own line of enquiry might find the following programs useful for calculating these values.

```
10 INPUT "STARTING VALUE": N
20 Z=N: S=0: M=N
30 IF Z=1 THEN GOTO 70
40 IF Z=2 = INT (.5Z) THEN Z=Z/2:
   S=S+1: GOTO 30
50 Z=Z*3+1: S=S+1: IF Z > M THEN
   M=Z
60 GOTO 30
70 PRINT "VALUE": N: "HAS A PATH
   LENGTH OF": S
80 PRINT "AND A MAX. VALUE OF": M
90 GOTO 10
```

If a few figures are worked out it will be seen that, except for a few generalised examples, there is no correlation between any value (N) and its corresponding S and M values. The only predictable values are

powers of 2 where 2<sup>n</sup> is its own maximum value, and has a path length of n.

If these relationships are studied more closely, certain other enigmatic properties become tantalisingly apparent. For example many numbers share the same path length, and whole groups of numbers reach the same maximum value. Indeed, certain consecutive numbers can even share the same path length and maximum value. This month's competition is to find not two but five consecutive numbers with this property. There are many such sets, but which is the smallest?

## Prize

FIFTEEN readers can win themselves copies of Software Projects' famed arcade game Jet Set Willy, the follow up to Manic Miner.

## Rules

TO WIN a copy of Jet Set Willy, you must both show the answer to the competition and how to solve it with the use of a Basic program written on your Dragon. Please do not send in a cassette containing your answer. Please also make sure your name and address are printed clearly on your entry, and mark the envelope August competition.

As a bonus, insert names for three Jet Set Willy type games — the funnier the better.

Your entry must reach Dragon User by the last working day in August. Winners will be announced in the November issue. The editor's decision is final, and no correspondence will be entered into.

## May Winners

THE FOLLOWING people won Sprint Music Compiler: Adrian Shuttleworth of Wakefield, Kevin Jones of Pontefract, M J Pell of York, J McDonough of Fleetwood, S J Wells of Deal, P Blawie of Carlisle, J Thomas of North Walsham, B Morris of Rogentstone, C Holt of Basing, P Wilkins of Stone, B Seelman of Colley, Rachel Edmunds of Sedgford, Pii Gamle of Norway, C J Smith of Cheshamford and Simon Cayula of Mole.

They will be receiving their copies of Sprint soon.

Figure 1 — path length and maximum value

Number (N)	No. of steps (S)	Max. value reached (M)
26	10	40
27	111	9232
28	16	52



## Two more great games from A'N'E.



100



100

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

Who'd have thought a country farmyard could be so stressful? You must collect the eggs before the nasties get out and eat up all your corn. Watch out for the crazy duck – if she gets out of the cage, you're mental! (Available)

**Keywords:** child sexual abuse; disclosure; social support

Monitors, screens, scissors and even food will impede your passage through this multi-screen game. Our hero must negotiate his way through the 35-complex screens, collecting the key to the next level on the way. There are numerous tips and reminders to further your progress, which include scies, screens, drinks, food, scissors, electric walls, moving platforms, collapsing floors, belts, conveyor belts and many more.

By skilful use of the platform, railways and the switches you might survive to level 24, then you face the challenge of the penultimate and level – only the experts will make it.



001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019 020 021 022 023 024 025 026 027 028 029 030 031 032 033 034 035 036 037 038 039 040 041 042 043 044 045 046 047 048 049 050 051 052 053 054 055 056 057 058 059 060 061 062 063 064 065 066 067 068 069 070 071 072 073 074 075 076 077 078 079 080 081 082 083 084 085 086 087 088 089 090 091 092 093 094 095 096 097 098 099 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

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